Outdoor Heat Pump

User's Information/Installation Instructions

13 SEER High Efficiency Split System

These units have been designed and tested for capacity and efficiency in accordance with A.R.I. Standards. Split System Heat Pump units are designed for use with a wide variety of fossil fuel furnaces, electric furnaces, air handlers, and evaporator coil combinations.

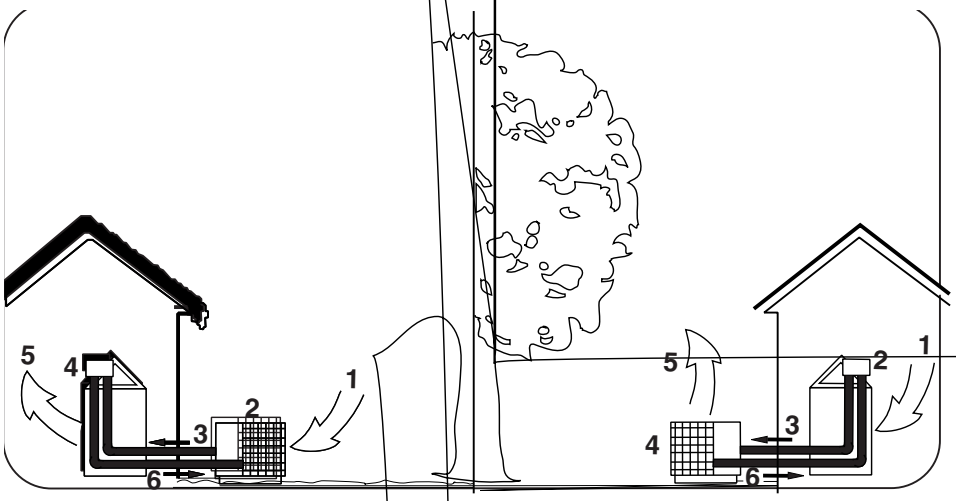
These instructions are primarily intended to assist qualified individuals experienced in the proper installation of heating and/or air conditioning appliances. Some local codes require licensed installation/service personnel for this type of equipment. Read all instructions carefully before starting the installation.

USER'S INFORMATION

IMPORTANT

Read this owner information to become familiar with the capabilities and use of your appliance. Keep this with literature on other appliances where you have easy access to it in the future. If a problem occurs, check the instructions and follow recommendations given. If these suggestions don't eliminate your problem, call your servicing contractor.

Heat Pump Principle of Operation



WINTER HEATING

1. Outdoor air enters heat pump.
2. Cold, heat-transfer section (outdoor coil) extracts heat from outdoor air as refrigerant evaporates from a liquid to a gas.
3. Refrigerant, compressed to a hot gas by heat pump, carries the heat to the hot heat-transfer section (indoor coil).
4. Hot, heat-transfer section (indoor coil) releases the heat to indoor air as refrigerant condenses from a gas to a liquid.
5. Air handler circulates the heat throughout the home.
6. Refrigerant returns to outdoor coil and evaporates once again to absorb more heat.

SUMMER COOLING

1. Indoor air enters the air handler section.
2. Cold, heat-transfer section (indoor coil) extracts heat from indoor air as refrigerant evaporates from a liquid to a cold gas.
3. Refrigerant, drawn to heat pump and compressed to a hot gas by heat pump, carries the heat outdoors.
4. Hot, heat-transfer section (outdoor coil) releases the heat as refrigerant condenses from a gas to a liquid.
5. Heat pump (outdoor fan) discharges the heat to outside air.
6. Refrigerant returns to indoor coil and evaporates once again to absorb more heat.

OPERATING INSTRUCTIONS

TO OPERATE YOUR HEAT PUMP FOR COOLING

1. Set the thermostat system switch to COOL and the thermostat fan switch to AUTO. **(See Figure 1)**

2. Set the thermostat temperature to the desired temperature level using the temperature selector. Please refer to the separate detailed thermostat user's manual for complete instructions regarding thermostat programming. The outdoor unit and indoor blower will both cycle on and off to maintain the indoor temperature at the desired cooling level.

   NOTE: If the thermostat temperature level is re-adjusted, or the thermostat system switch is repositioned, the outdoor unit may not start immediately. The outdoor unit contains a protective timer circuit which holds the unit off for approximately five minutes following a previous operation, or the interruption of the main electrical power.

TO OPERATE YOUR HEAT PUMP FOR HEATING

1. Set the thermostat system switch to HEAT and the thermostat fan switch to AUTO. **(See Figure 1)**

2. Set the thermostat temperature to the desired temperature level using the temperature selector. Please refer to the separate detailed thermostat user's manual for complete instructions regarding thermostat programming. The outdoor unit and indoor blower will both cycle on and off to maintain the indoor temperature at the desired heating level.

   NOTE: If the thermostat temperature level is re-adjusted, or the thermostat system switch is repositioned, the outdoor unit may not start immediately. The outdoor unit contains a protective timer circuit which holds the unit off for approximately five minutes following a previous operation, or the interruption of the main electrical power.

Emergency Heat:

The thermostat includes a system switch position termed EM. HT. This is a back-up heating mode to be used only if there is a suspected problem with the outdoor unit. With the system switch set to EM. HT. the outdoor unit will be locked off, and supplemental heat (typically electric resistance heating) will be used as a source of heat. Sustained use of electric resistance heat in place of the heat pump will result in an increase in electric utility costs.

Defrost:

During cold weather heating operation, the outdoor unit will develop a coating of snow and ice on the heat transfer coil. This is normal, and the unit will periodically defrost

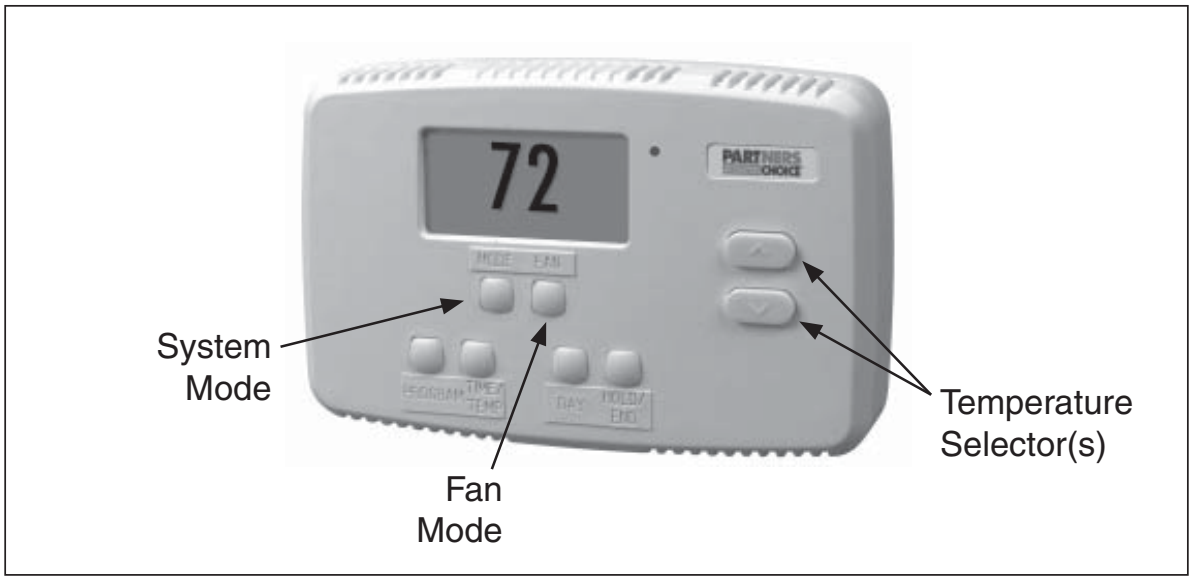


Figure 1. Typical Thermostat

itself. During the defrost cycle, the outdoor fan will stop, and the compressor will continue to run and heat the outdoor coil, causing the snow and ice to melt. After the snow and ice have melted, some steam may rise from the outdoor unit as the warm coil causes some melted frost to evaporate.

TO OPERATE YOUR HEAT PUMP FOR AUTOMATIC COOLING AND HEATING

1. Set the thermostat system switch to AUTO and the thermostat fan switch to AUTO. **(See Figure 1)**

   Note: Thermostats will vary. Some models will not include the AUTO mode, and others will have the AUTO in place of the HEAT and COOL, and some will include all three.

2. Set the thermostat temperature to the desired heating and cooling temperature level(s). The outdoor unit and the indoor blower will then cycle on and off in either the heating or cooling mode of operation as required to automatically maintain the indoor temperature within the desired limits.

TO SHUT OFF YOUR HEAT PUMP

Set the thermostat system switch to OFF and the thermostat fan switch to AUTO. **(See Figure 1)** The system will not operate, regardless of the thermostat temperature selector(s) setting.

TO OPERATE THE INDOOR BLOWER CONTINUOUSLY

Set the thermostat fan switch to ON **(See Figure 1)**. The indoor blower will start immediately, and will run continually until the fan switch is reset to AUTO.

The continuous indoor blower operation can be obtained with the thermostat system switch set in any position, including OFF.

The continuous indoor blower operation is typically used to circulate the indoor air to equalize a temperature unbalance due to a sun load, cooking, or fireplace operation.

TO MAINTAIN YOUR HEAT PUMP

⚠ CAUTION:

Be certain the electrical power to the outdoor unit and the furnace/air handler is disconnected before doing the following recommended maintenance.

1. **Regularly:**

   a. Clean or replace the indoor air filter at the start of each heating and cooling season, and when an accumulation of dust and dirt is visible on the air filter. Inspect the filter monthly.

   b. Remove any leaves and grass clippings from the coil in the outdoor unit, being careful not to damage the aluminum fins.

   c. Check for any obstruction such as twigs, sticks, etc.

   d. Certain models have external panels fabricated from a premium grade of stainless steel designed to inhibit corrosion. For such units, if the unit is located in a coastal region or other area subjected to high concentrations of salt, then the unit should be hosed off after storms and monthly otherwise to maintain its new appearance.

⚠ CAUTION:

Do not over-oil, or oil motors not factory-equipped with oil tubes. The compressor is hermetically "sealed" and does not require lubrication.

2. **Before Calling a Service Technician, Be Certain:**

   a. The unit thermostat is properly set—see "To Operate Your Heat Pump for Cooling" and "To Operate Your Heat Pump for Heating."

   b. The unit disconnect fuses are in good condition, and the electrical power to the unit is turned on.

Read Your Warranty

Please read the separate warranty document completely. It contains valuable information about your system.

GENERAL INFORMATION

Read the following instructions completely before performing the installation.

Outdoor Unit Section — Each outdoor unit is shipped with a refrigerant charge adequate to operate the outdoor section with an indoor matching coil or air handler. Units with braze connections include the proper amount of refrigerant for an additional 15 ft. of refrigerant lines the same size as the valve fittings.

NOTE: DO NOT USE ANY PORTION OF THE CHARGE FOR PURGING OR LEAK TESTING.

Matching coils and air handlers may be shipped with a small holding charge to pressurize them to keep out contaminants. To release the pressure, read the indoor section installation instructions carefully.

Liquid and Suction Lines — Fully annealed, refrigerant grade copper tubing should be used when installing the system. Refrigerant suction line tubing should be fully insulated.

Field Connections for Electrical Power Supply — All wiring must comply with current provisions of the "National Electrical Code" (ANSI/NFPA 70) and with applicable local codes having jurisdiction. The minimum size of electrical conductors and circuit protection must be in compliance with information listed on the outdoor unit data label.

SAFETY CONSIDERATIONS

Pressures within the System — Split system heat pump equipment contains liquid and gaseous refrigerant under pressure. Installation and servicing of this equipment should be accomplished by qualified, trained personnel thoroughly familiar with this type of equipment. Under no circumstances should the Homeowner attempt to install and/or service the equipment.

Labels, Tags, Precautions — When working with this equipment, follow all precautions in the literature, on tags, and on labels provided with the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.

Brazing Operations — Installation of equipment may require brazing operations. Safety codes must be complied with. Safety equipment (e.g.; safety glasses, work gloves, fire extinguisher, etc.) must be used when performing brazing operations.

⚠ WARNING:

Ensure all electrical power to the unit is off prior to installing or servicing the equipment. Failure to do so may cause personal injury or death.

SITE PREPARATION

Unpacking Equipment — Remove the cardboard carton and User's Manual from the equipment. Take care to not damage tubing connections when removing from the carton.

Inspect for Damage — Inspect the equipment for damage prior to installing the equipment at the job site. Ensure coil fins are straight and, if necessary, comb fins to remove flattened and bent fins.

Preferred Location of the Outdoor Unit at the Job Site — Conduct a survey of the job site to determine the optimum location for mounting the outdoor unit. Overhead obstructions, poorly ventilated areas, and areas subject to accumulation of debris should be avoided. The outdoor unit should be installed no closer than 18 inches from the outside walls of the facility and in an area free from overhead obstructions to ensure unrestricted airflow through the outdoor unit.

Facility Prerequisites — Electrical power supplied must be adequate for proper operation of the equipment. The system must be wired and provided with circuit protection in accordance with local building codes and the National Electrical Code.

INSTALLING THE OUTDOOR UNIT

Slab Mount — The site selected for a slab mount installation requires a stable foundation and one not subject to erosion. The slab should be level and anchored (if necessary) prior to placing the equipment on the slab.

Cantilever Mount — The cantilever mount should be designed with adequate safety factor to support the weight of the equipment, and for loads subjected to the mount during operation. Installed equipment should be adequately secured to the cantilever mount and levelled prior to operation of the equipment.

Roof Mount — The method of mounting should be designed so as not to overload roof structures nor transmit noise to the interior of the structure. Refrigerant and electrical line should be routed through suitably waterproofed openings to prevent water leaking into the structure.

INSTALLING THE INDOOR UNIT

The indoor section should be installed before proceeding with routing of refrigerant piping. Consult the Installation Instructions of the indoor unit (i.e.: air handler, furnace, etc.) for details regarding installation.

CONNECTING REFRIGERANT TUBING BETWEEN THE INDOOR AND OUTDOOR UNIT

General — Once outdoor and indoor unit placement has been determined, route refrigerant tubing between the equipment in accordance with sound installation practices. Refrigerant tubing should be routed in a manner that minimizes the length of tubing and the number of bends in the tubing. Refrigerant tubing should be supported in a manner that the tubing will not vibrate or abrade during system operation. Tubing should be kept clean of foreign debris during installation and installation of a liquid line filter drier is recommended if cleanliness or adequacy of system evacuation is unknown or compromised. Every effort should be made by the installer to ensure that the field installed, refrigerant containing components of the system have been installed in accordance with these instructions and sound installation practices so as to insure reliable system operation and longevity.

The maximum recommended interconnecting refrigerant line length is 75 feet, and the vertical elevation difference between the indoor and outdoor sections should not exceed 20 feet. Consult long line application guide for installations in excess of these limits.

Filter Dryer Installation — A filter dryer is provided with PS series models only and must be installed in the liquid line of the system. If the installation replaces a system with a filter dryer already present in the liquid line, the filter dryer must be replaced with the one supplied with the unit. The filter dryer must be installed in strict accordance with the manufacturer's installation instructions.

For all other series models, installing a filter dryer is optional. However, it is good installation practice to install a filter dryer when replacing the evaporator and/or condenser of a system. When installing, the filter dryer must be installed in strict accordance with the manufacturer's installation instructions.

Optional Equipment — Optional equipment (e.g.: liquid line solenoid valves, etc.) should be installed in strict accordance with the manufacturer's installation instructions.

ELECTRICAL CONNECTIONS

⚠ WARNING:

Turn off all electrical power at the main circuit box before wiring electrical power to the outdoor unit. Failure to comply may cause severe personnel injury or death.

Wiring Diagram/Schematic — A wiring diagram/schematic is located on the inside cover of the electrical box of the outdoor unit. The installer should become familiar with the wiring diagram/schematic before making any electrical connections to the outdoor unit.

Outdoor Unit Connections — The outdoor unit requires both power and control circuit electrical connections. Refer to the unit wiring diagram/schematic for identification and location of outdoor unit field wiring interfaces.

Control Circuit Wiring — The outdoor unit is designed to operate from a 24 VAC Class II control circuit. Control circuit wiring must comply with the current provisions of the "National Electrical Code" (ANSI/NFPA 70) and with applicable local codes having jurisdiction.

Thermostat connections should be made in accordance with the instructions supplied with the thermostat, and with the instructions supplied with the indoor equipment. A typical residential installation with a heat pump thermostat and air handler are shown below.

Electrical Power Wiring — Electrical power wiring must comply with the current provisions of the "National Electrical Code" (ANSI/NFPA 70) and with applicable local codes having jurisdiction. Use of rain tight conduit is recommended. Electrical conductors shall have minimum circuit ampacity in compliance with the outdoor unit rating label. The facility shall employ electrical circuit protection at a current rating no greater than that indicated on the outdoor unit rating label. Refer to the unit wiring diagram for connection details.

Minimum Circuit Ampacity — Electrical wiring to the equipment must be compatible and in compliance with the minimum circuit ampacity listed on the outdoor unit data label.

COPPER WIRE SIZE — AWG (1% Voltage Drop)				
Supply Wire Length-Feet				Supply Circuit
200	150	100	50	Ampacity
6	8	10	14	15
4	6	8	12	20
4	6	8	10	25
4	4	6	10	30
3	4	6	8	35
3	4	6	8	40
2	3	4	6	45
2	3	4	6	50

Wire Size based on N.E.C. for 60° type copper conductors.

Maximum Fuse/Circuit Breaker Size — Circuit protection for the outdoor unit must be compatible with the maximum fuse/circuit breaker size listed on the outdoor unit data label.

Disconnect Switch — An electrically compatible disconnect switch must be within line of sight of the outdoor unit. This switch shall be capable of electrically de-energizing the outdoor unit.

Optional Equipment — Optional equipment requiring connection to the power or control circuits must be wired in strict accordance with current provisions of the "National Electrical Code" (ANSI/NFPA 70), with applicable local codes having jurisdiction, and the installation instructions provided with the equipment. Optional Equipment (e.g.: liquid line solenoid valves, hard start kits, low suction pressure cutout switch kit, high pressure cutout switch kit, refrigerant compressor crankcase heater, etc.) should be installed in strict accordance with the manufacturer's installation instructions.

STARTUP AND CHECKOUT

⚠ WARNING:

Ensure electrical power to the unit is off prior to performing the following steps. Failure to do so may cause personal injury or death.

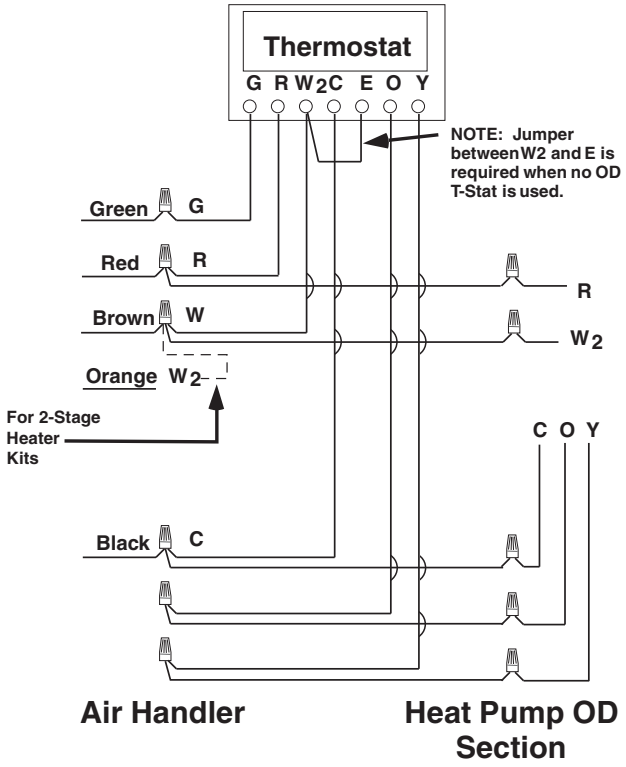
Air Filters — Ensure air filters are clean and in place prior to operating the equipment.

Thermostat — Set the room thermostat function switch to OFF, fan switch to AUTO, and adjust the temperature setpoint to its highest setting.

Prior to applying electrical power to the outdoor unit, ensure that the unit has been properly and securely grounded, and that power supply connections have been made at both the facility power interface and outdoor unit.

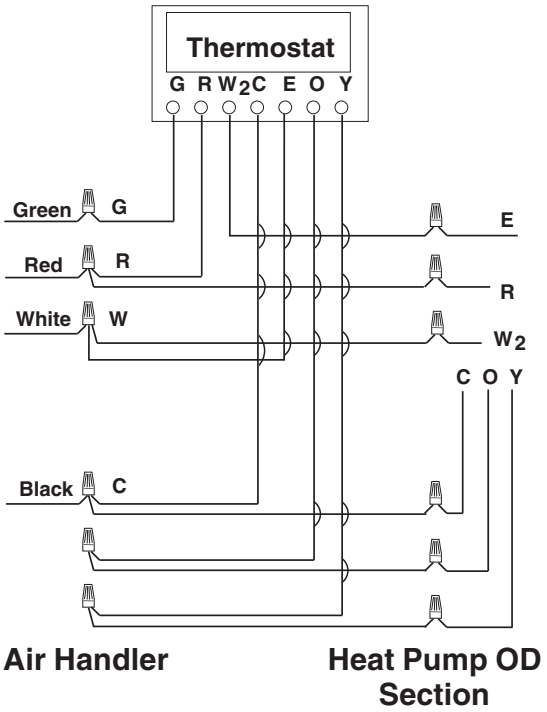
Outdoor Unit — Ensure the outdoor coil and top of the unit are free from obstructions and debris, and all equipment access/control panels are in place.

Using extreme caution, apply power to the unit and inspect the wiring for evidence of open, shorted, and/or improperly wired circuits.



Typical Heat Pump with Standard Air Handler

A typical installation with a heat pump thermostat, air handler, and heat pump with an outdoor thermostat.



Typical Heat Pump with Outdoor Thermostat and Air Handler

Functional Checkout:

⚠ CAUTION:

If equipped with a compressor crankcase heater, wait 24 hours prior to performing a function checkout to allow for heating of the compressor crankcase. Failure to comply may result in damage and could cause premature failure of the system.

Indoor Blower — Set the thermostat function switch to COOLING and the fan switch to ON. Verify that the indoor blower is operating and that airflow is not restricted. Set the fan switch back to AUTO.

Positive Temperature Coefficient Resistor (PTCR) — (select models) A PTCR is factory installed and located on the control panel of the outdoor unit. The PTCR is a soft start device for use with reciprocating compressors. If a hard start kit is needed on this model the soft start (PTCR) must be removed first.

Low-Pressure Switch — A low-pressure switch is factory-installed in select models only. If provided, this switch is located in the suction line internal to the outdoor unit. The switch is designed to protect the compressor from a loss of charge. Under normal conditions, the switch is closed. If the suction pressure falls below 5 psig, then the switch will open and de-energize the outdoor unit. The switch will close again once the suction pressure increases above 20 psig. Please note that the switch interrupts the thermostat inputs to the unit. Thus, when the switch opens and then closes, there will be a 5 minute short cycling delay before the outdoor unit will energize.

Comfort Alert™ Diagnostics (Select Models) — The Comfort Alert™ diagnostics module is a breakthrough innovation for troubleshooting heat pump and air conditioning system failures. The module installs easily in the electric box of the outdoor unit near the compressor contactor. By monitoring and analyzing data from the Copeland Scroll compressor® and the thermostat demand, the module can accurately detect the cause of electrical and system related failures without any sensors. A flashing LED indicator communicates the ALERT code and guides the service technician more quickly and accurately to the root cause of a problem.

NOTE: This module does not provide safety protection! The Comfort Alert™ module is a monitoring device and cannot shut down the compressor directly.

LED Description (See Figure 2)
POWER LED (Green): indicates voltage is present at the power connection of the module.

ALERT LED (Yellow): communicates an abnormal system condition through a unique flash code. The ALERT LED will flash a number of times consecutively, pause and then repeat the process. The number of consecutive flashes, defined as the Flash Code, correlates to a particular abnormal condition. Detailed descriptions of specific ALERT Flash Codes are shown in Table 1 of this manual.

TRIP LED (Red): indicates there is a demand signal from the thermostat but no current to the compressor is detected by the module. The TRIP LED typically indicates the compressor protector is open or may indicate missing supply power to the compressor.

The scroll compressor's run (R), common (C) and start (S) wires are routed through the holes in the Comfort Alert™ module marked "R," "C" and "S." The common (C) wire need not be routed through the module for it to operate properly.

24 VAC Power Wiring — The Comfort Alert™ module requires a constant nominal 24 VAC power supply. The wiring to the module's R and C terminals must be directly from the indoor unit or thermostat.

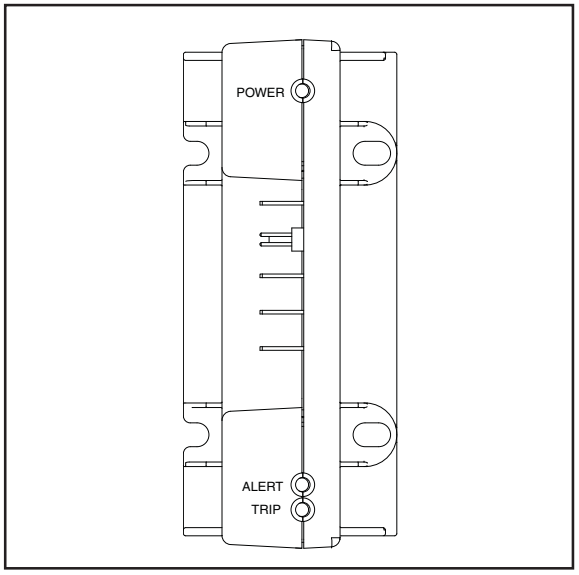


Figure 2. Comfort Alert™ Diagnostics Module

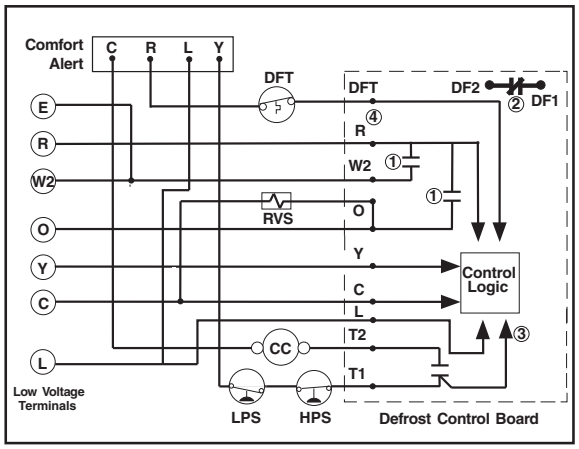


Figure 3. 24VAC Comfort Alert™ Wiring Diagram

The module cannot be powered by the C terminal on a defrost board or other control board without experiencing nuisance alerts.

NOTE: After the thermostat demand signal is connected, verify that 24 VAC across Y and C when demand is present.

NOTE: Factory installed modules may have different thermostat demand signal wiring. Follow manufacturer's wiring instructions when replacing module.

TROUBLESHOOTING

Interpreting The Diagnostic LEDs – When an abnormal system condition occurs, the Comfort Alert™ module displays the appropriate ALERT and/or TRIP LED will flash a number of times consecutively, pause and then repeat the process. To identify a Flash Code number, count the number of consecutive flashes.

Every time the module powers up, the last ALERT Flash Code that occurred prior to shut down is displayed for one minute.

Cooling — Gradually lower the thermostat temperature setpoint below the actual room temperature and observe that the outdoor unit and indoor blower energize. Feel the air being circulated by the indoor blower and verify that it is cooler than ambient temperature. Listen for any unusual noises. If present, locate and determine the source of the noise and correct as necessary.

Short Cycle Protection — With the system operating in COOLING mode, note the setpoint temperature setting of the thermostat, and gradually raise the setpoint temperature until the outdoor unit and indoor blower de-energize. Immediately lower the setpoint temperature of the thermostat to its original setting and verify that the indoor blower is energized and that the outdoor unit remains de-energized. Verify that, after approximately 5 minutes, the outdoor unit energizes and that the temperature of the air supplied to the facility is cooler than ambient temperature.

Heating — Lower the thermostat setpoint temperature to the lowest obtainable setting and set the thermostat function switch to HEATING. The indoor blower and outdoor unit should stop running. After a minimum of five minutes, increase the setpoint temperature of the thermostat to the maximum setting. Verify that the outdoor unit and indoor blower have energized. Feel the air being circulated by the indoor blower and verify that it is warmer than ambient temperature. Listen for any unusual noises. If present, locate and determine the source of the noise and correct as necessary.

NOTE: Other sources for heating (i.e.: electric furnace, fossil fuel furnace, air handler with electric heat options, etc.) that interface with the unit should be functionally checked to verify system operation and compatibility. Refer to the installation instructions for this equipment and perform a functional checkout in accordance with the manufacturer's instructions.

OUTDOOR THERMOSTAT (if supplied)

The outdoor thermostat prevents the electrical auxiliary heat (if used) from operating above 40°F outdoor ambient temperature.

Defrost Cycle Timer — The defrost cycle timer controls the time interval of the hot gas defrost after the defrost sensor closes. It is located in the lower left corner of the defrost control board. Three interval settings are available: 30 minutes, 60 minutes, and 90 minutes. Time setting selection is dependent on the climate where the unit is being installed.

Example 1. Dry climate of Southern Arizona. A 90 minute setting is recommended.

Example 2. Moist climate of Seattle, Washington. A 30 minute setting is recommended.

To set the cycle timer, place the timing pin on the defrost control board to the desired time interval post.

Status LED	Status LED Description	Status LED Troubleshooting Information
Green "POWER"	Module has power	Supply voltage is present at module terminals
Red "TRIP"	Thermostat demand signal Y is present, but the compressor is not running	1. Compressor protector is open 2. Outdoor unit power disconnect is open 3. Compressor circuit breaker or fuse(s) is open 4. Broken wire or connector is not making contact 5. Low pressure switch open if present in system 6. Compressor contactor has failed open
Yellow "ALERT" Flash Code 1	**Long Run Time** Compressor is running extremely long run cycles	1. Low refrigerant charge 2. Evaporator blower is not running 3. Evaporator coil is frozen 4. Faulty metering device 5. Condenser coil is dirty 6. Liquid line restriction (filter drier blocked if present in system) 7. Thermostat is malfunctioning 8. Comfort Alert Failure
Yellow "ALERT" Flash Code 2	**System Pressure Trip** Discharge or suction pressure out of limits or compressor overloaded	1. High head pressure 2. Condenser coil poor air circulation (dirty, blocked, damaged) 3. Condenser fan is not running 4. Return air duct has substantial leakage 5. If low pressure switch present in system, check Flash Code 1 information
Yellow "ALERT" Flash Code 3	**Short Cycling** Compressor is running only briefly	1. Thermostat demand signal is intermittent 2. Time delay relay or control board defective 3. If high pressure switch present go to Flash Code 2 information 4. If low pressure switch present go to Flash Code 1 information
Yellow "ALERT" Flash Code 4	**Locked Rotor**	1. Run capacitor has failed 2. Low line voltage (contact utility if voltage at disconnect is low) • Check wiring connections 3. Excessive liquid refrigerant in compressor 4. Compressor bearings are seized • Measure compressor oil level
Yellow "ALERT" Flash Code 5	**Open Circuit**	1. Outdoor unit power disconnect is open 2. Compressor circuit breaker or fuse(s) is open 3. Compressor contactor has failed open • Check compressor contactor wiring and connectors • Check for compressor contactor failure (burned, pitted or open) • Check wiring and connectors between supply and compressor • Check for low pilot voltage at compressor contactor coil 4. High pressure switch is open and requires manual reset 5. Open circuit in compressor supply wiring or connections 6. Unusually long compressor protector reset time due to extreme ambient temperature 7. Compressor windings are damaged • Check compressor motor winding resistance
Yellow "ALERT" Flash Code 6	**Open Start Circuit** Current only in run circuit	1. Run capacitor has failed 2. Open circuit in compressor start wiring or connections • Check wiring and connectors between supply and the compressor "S" terminal 3. Compressor start winding is damaged • Check compressor motor winding resistance
Yellow "ALERT" Flash Code 7	**Open Run Circuit** Current only in start circuit	1. Open circuit in compressor run wiring or connections • Check wiring and connectors between supply and the compressor "R" terminal 2. Compressor run winding is damaged • Check compressor motor winding resistance
Yellow "ALERT" Flash Code 8	**Welded Contactor** Compressor always runs	1. Compressor contactor has failed closed 2. Thermostat demand signal not connected to module
Yellow "ALERT" Flash Code 9	**Low Voltage** Control circuit < 17VAC	1. Control circuit transformer is overloaded 2. Low line voltage (contact utility if voltage at disconnect is low) • Check wiring connections

- *Flash Code number corresponds to a number of LED flashes, followed by a pause and then repeated.*
- *TRIP and ALERT LEDs flashing at same time means control circuit voltage is too low for operation.*

Table 1. Interpreting the Diagnostic LEDS

Miswired Module Indication	Recommended Troubleshooting Action
Green LED is not on, module does not power up	Determine if both R and C module terminals are connected. Verify voltage is present at module's R and C terminals. Review **24VAC Power Wiring** (page 4) for R and C wiring.
Green LED intermittent, module powers up only when compressor runs	Determine if R and Y terminals are wired in reverse. Verify module's R and C terminals have a constant source. Review **24VAC Power Wiring** (page 4) for R and C wiring.
TRIP LED is on but system and compressor check OK	Verify Y terminal is connected to 24VAC at contactor coil. Verify voltage at contactor coil falls below 0.5VAC when off.
TRIP LED and ALERT LED flashing together	Verify R and C terminals are supplied with 19-28VAC.
ALERT Flash Code 3 (Compressor Short Cycling) displayed incorrectly	Verify Y terminal is connected to 24VAC at contactor coil. Verify voltage at contactor coil falls below 0.5VAC when off.
ALERT Flash Code 5, 6 or 7 (Open Circuit, Open Start Circuit or Open Run Circuit) displayed incorrectly	Check that compressor run and start wires are through module's current sensing holes. Verify Y terminal is connected to 24VAC at contactor coil. Verify voltage at contactor coil falls below 0.5VAC when off.
ALERT Flash Code 6 (Open Start Circuit) displayed for Code 7 (Open Run Circuit) or vice versa	Check that compressor run and start wires are routed through the correct module sensing holes.
ALERT Flash Code 8 (Welded Contactor) displayed incorrectly	Determine if module's Y terminal is connected. Verify Y terminal is connected to 24VAC at contactor coil. Verify 24VAC is present across Y and C when thermostat demand signal is present. If not, R and C are reverse wired. Verify voltage at contactor coil falls below 0.5VAC when off.

Table 2. Module Wiring Troubleshooting

Note: All units are shipped from the factory with the default time setting of 30 minutes. Maximum heating performance can be achieved by setting the time to 90 minutes.

DEFROST CONTROL BOARD OPERATION AND TESTING

1. Terminals "R"-"C" must have 24±V present between them in order for the time delay and defrost sequences to be operational.

2. Jumper the "T2"-"DFT" test pins. This will indicate to the board that the defrost T-stat is closed(if the compressor is running). Defrost T-stat is closed at 32° or below and is open at 68° or above. But it's state is unknown if the temperature is between 32°F and 68°F. The defrost thermostat tells the board whether a defrost cycle needs to be started or terminated. With the DFT closed the unit will run for 30/60/90 minutes in heat mode and then defrost the outdoor coil. The defrost will turn off the outdoor fan, turn on the compressor and raise the the coil temperature to 68°F. This will open the DFT and terminate the defrost. If the DFT does not open the defrost will end after 10 minutes.

3. Defrost board speed-up. With compressor running in heat mode, next jump the "Test" pin to "C" on terminal strip. This will initiate a defrost test in 5, 10 or 15 seconds (This is determined by the 30, 60 or 90 minute defrost pin settings. The factory setting will be 30 minutes). Note that this will bypass the compressor off delay when the unit goes into defrost test and if left in defrost test, the delay will be bypassed when the test is terminated by the processor. If the jumper is removed before the test is over the processor will perform the remainder of a normal defrost. See step 2 above.

4. Remove the jumpers.

Note: The delay/no-delay pin concerns compressor operation during defrosts. The default setting is delay. Reciprocating compressors should only use this setting in conjunction with an approved

hard start kit. Scroll compressors that have noise issues while going into or coming out of defrost should use this 30 second delay to reduce the defrost noise. To switch from no-delay to delay remove the pin from the "no-delay" pin location and shift it to the "delay" pin location.

Speed up changes:

Manually initiating a defrost will cause the compressor to run continually when entering defrost.

Normal defrost operation:

To test normal defrost operation when the temperature is above 35°F, jumper "R" to "DFT" on the 624656 board and allow the unit to run for 30 minutes. Defrost will continue until the "R" to "DFT" jumper is removed or for 10 minutes. Remove the jumper.

The 5 minute time delay feature can be shortened 1 time to 1 second by jumping the "Test" to "C" terminal. Remove the jumper and repeat as desired.

Note: If jumper is left on the "Test" to "common" pins permanently, the defrost cycle will become inoperable.

Defrost Test Procedure for 624656

1. Jumper "T2" to "DFT" at the test terminals.
2. With unit running in heat mode, short the "TEST" terminal to the common terminal near it. This will speed up the board and cause it to enter defrost mode in 5/10/15 seconds depending on the defrost time selection. Compressor delay will not function during speed-up.
3. This test will end in 5 seconds if the "TEST"-common short is not removed.
4. Remove both the short and the "T2" to "DFT" jumper to terminate the defrost cycle. The 30 second compressor delay should operate normally.
5. Test is complete, reset thermostat to home owner preference.

13 SEER Split System Heat Pump Orifice Usage with CRK7 Compressor

Model Number	Restrictor Bore Size (inches)		System Charge R-22 (oz.)
	Indoor	Outdoor	
2.0 Ton	0.061	0.049	126
2.5 Ton	0.068	0.049	144

Optional Equipment — A functional checkout should be performed in accordance with the checkout procedures supplied with the equipment.

Adjustment of Refrigerant Charge:

⚠ CAUTION:

Split system heat pump equipment contains liquid and gaseous refrigerant under pressure. Adjustment of refrigerant charge should only be attempted by qualified, trained personnel thoroughly familiar with the equipment. Under no circumstances should the homeowner attempt to install and/or service this equipment. Failure to comply with this warning could result in equipment damage, personal injury, or death.

NOTE: The following Refrigerant Charging Charts are applicable to listed assemblies of equipment and at listed airflows for the indoor coil. Assemblies of indoor coils and outdoor units not listed are not recommended and deviations from rated airflows or non-listed equipment combinations may require modifications to the expansion device(s) and refrigerant charging procedures for proper and efficient system operation.

Refrigerant Charging Chart — Refer to Refrigerant Charging Charts for correct system charging, and to Orifice Usage Chart for correct restrictor sizes.

NOTE: Linesets over 15 feet in length may require additional refrigerant charge. NORDYNE recommends 0.6 oz. of refrigerant per foot for any lineset over 15 feet.

13 SEER Split System Heat Pump Orifice Usage with ZRK3/K4 Compressor

Model Number	Restrictor Bore Size (inches)		System Charge R2 (oz.)
	Indoor	Outdoor	
1.5 ton	0.053	0.041	93
2.0 ton	0.061	0.047	96
2.5 ton	0.069	0.049	144
3.0 ton	0.078	0.057	155
3.5 ton	0.083	0.059	248
4.0 ton	0.090	0.065	248
5.0 ton	0.101	0.071	268

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with ZRK4 Compressors

REFRIGERANT CHARGING CHARTS LEGEND FOR COOLING/HEATING MODES OF OPERATION

*Note: All pressures are listed in psig. and all temperatures in deg. F.

- Shaded boxes indicate flooded conditions

- Rated design values.

- In Cooling Mode suction pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.
- In Heating Mode, charge should be weighed in. It is strongly recommended to verify charge in Cooling Mode at ambient above 70°F.
- Discharge temperatures greater than charted values indicates a refrigerant undercharge.

1-1/2 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suction Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
73	140	135														
75	143	140	155	137												
77	145	146	157	143	170	140										
79	147	150	160	148	172	145	185	142								
81	151	153	162	152	175	150	187	147	200	144						
83			166	155	177	154	189	151	202	149	215	147				
85					181	157	192	155	204	153	217	151	230	149		
87							196	159	207	157	219	155	232	153	244	151
89							199	163	211	161	222	159	234	157	246	154
91									214	165	226	163	237	161	248	158
93											229	167	241	165	252	163
95													244	169	256	167
97															259	172
99																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with ZRK4 Compressors

2 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suction Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
71	149	137														
73	151	143	164	141												
75	154	148	166	146	179	145										
77	156	153	169	151	181	150	194	149								
79	160	155	171	156	184	155	196	153	209	152						
81			175	159	186	159	198	158	211	157	224	156				
83					190	162	202	162	213	161	226	160	239	160		
85							205	166	217	165	228	164	241	164	254	163
87							208	169	220	169	232	168	243	168	256	167
89									224	173	235	173	247	172	258	171
91											239	177	250	176	262	175
93													254	180	265	180
95															269	184
97																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with ZRK3 Compressors

2-1/2 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suction Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
70	143	136														
72	145	141	158	139												
74	147	147	160	144	173	142										
76	150	152	162	149	175	147	188	145								
78	153	155	165	154	177	152	190	149	202	147						
80			168	157	180	156	192	154	204	152	217	150				
82					183	159	195	158	207	156	219	154	232	152		
84							198	161	210	160	221	158	234	156	247	154
86							202	165	213	164	225	162	236	160	249	158
88									217	168	228	166	240	164	251	162
90											232	170	243	169	255	167
92													247	173	258	171
94															261	176
96																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with ZRK3 Compressors

3 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suction Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
71	148	144														
73	150	149	164	147												
75	152	155	166	152	179	149										
77	155	158	168	157	181	154	195	152								
79	159	161	171	161	183	159	197	156	210	154						
81			174	164	187	163	199	161	212	158	226	156				
83					190	166	202	165	214	163	228	161	241	159		
85							206	168	218	167	230	165	243	163	257	161
87							209	172	221	171	233	169	245	167	259	165
89									225	174	237	173	249	171	261	169
91											240	177	252	175	264	173
93													256	180	268	178
95															271	182
97																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with ZRK3 Compressors

3-1/2 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suction Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
71	144	150														
73	146	155	159	152												
75	148	161	161	157	175	153										
77	152	163	164	162	177	158	191	154								
79	155	165	167	164	179	163	193	159	206	156						
81			171	167	183	166	195	164	208	160	222	157				
83					186	169	198	167	210	165	224	162	237	159		
85							202	171	214	169	226	166	239	163	253	160
87							205	174	217	172	229	170	241	167	255	164
89									221	176	233	174	245	171	257	168
91											236	178	248	175	260	172
93													252	180	264	177
95															267	181
97																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with ZRK3 Compressors

4 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suct. Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
69	132	130														
71	134	136	149	135												
73	136	141	151	140	166	140										
75	137	149	153	145	168	145	183	145								
77	140	152	154	152	170	150	185	149	200	149						
79			158	155	172	155	188	154	203	153	218	153				
81					176	158	190	158	205	158	220	157	235	157		
83							193	162	207	162	222	162	237	161	252	161
85							197	166	211	166	225	166	239	165	254	165
87									214	170	229	170	243	170	256	169
89											232	174	246	174	260	174
91													250	178	264	178
93															267	183
95																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with ZRK3 Compressors

5 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suct. Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
66	143	146														
68	145	152	159	149												
70	147	157	161	154	175	152										
72	148	164	163	159	178	157	192	155								
74	152	167	165	165	180	162	194	159	208	157						
76			169	168	182	167	196	164	210	161	224	159				
78					185	170	198	168	212	166	226	164	240	161		
80							202	172	215	170	228	168	242	165	256	163
82							205	175	218	174	232	172	244	169	258	167
84									222	178	235	176	248	174	260	171
86											238	180	252	178	265	176
88													255	182	268	180
90															271	185
92																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with CRK7 Compressors

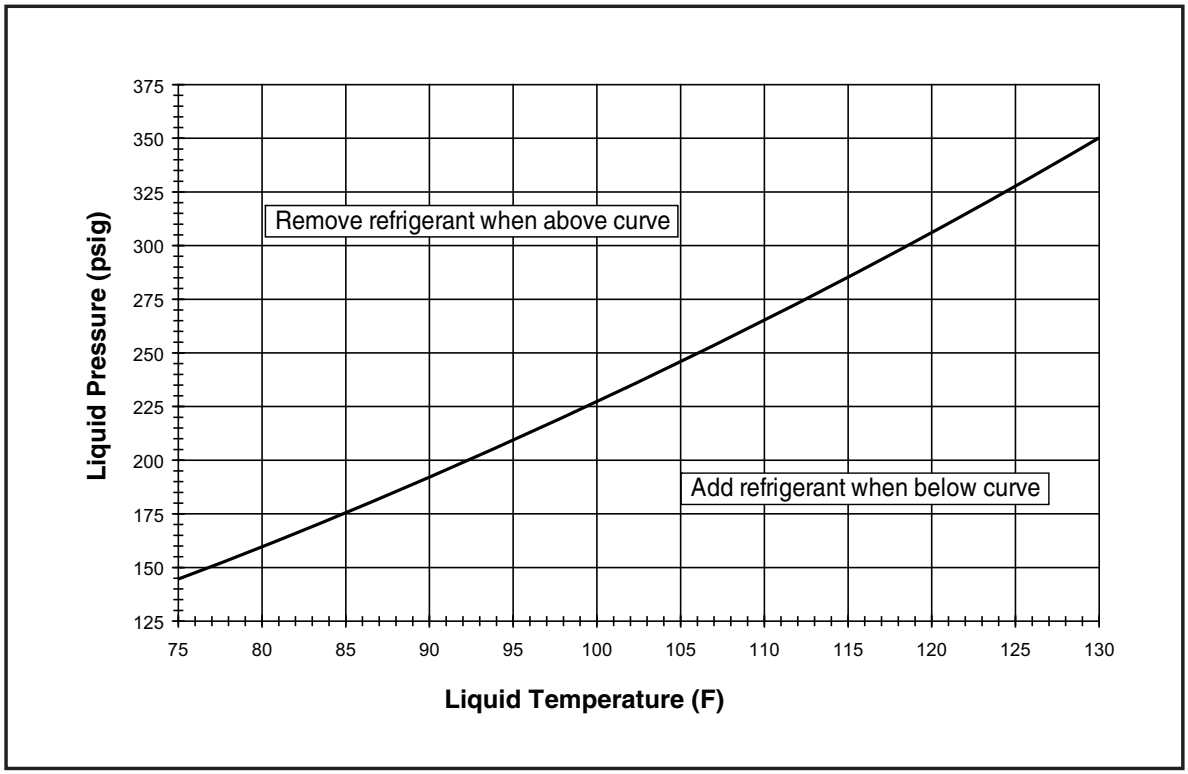
2 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suct. Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
73	159	152														
75	162	157	173	152												
77	164	162	175	157	187	152										
79	167	166	178	162	189	157	201	152								
81	171	168	181	165	191	162	203	157	215	152						
83			184	168	195	165	205	161	217	157	228	152				
85					198	169	208	165	219	161	230	156	242	152		
87							212	169	222	165	233	161	244	156	256	152
89							215	172	226	169	236	165	246	160	258	156
91									229	173	239	169	250	164	260	160
93											243	173	253	169	263	164
95													257	173	267	169
97															270	173
99																

Refrigerant Charging Charts for Cooling Mode of Operation
13 SEER Split System Restrictor Cooling Charging Charts with CRK7 Compressors

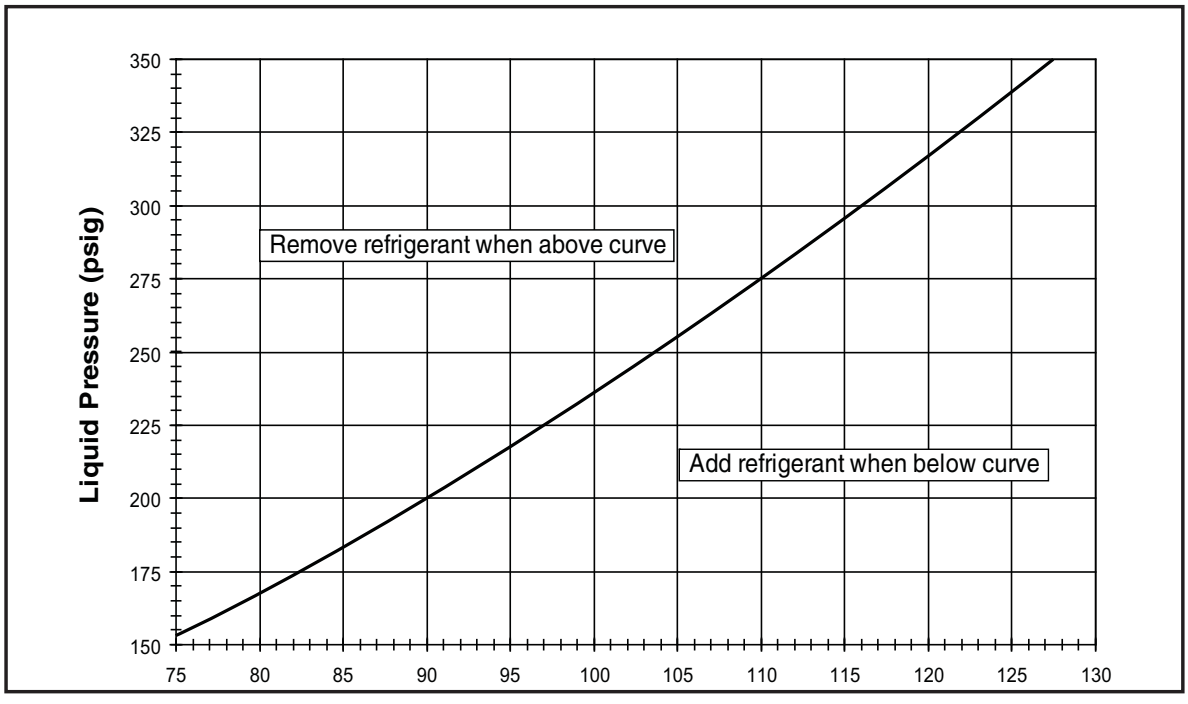
2-1/2 TON	OUTDOOR TEMPERATURE (°F)															
	70		75		80		85		90		95		100		105	
Suction Press.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.	Dis. Press.	Dis. Temp.
70	149	153														
72	151	158	164	153												
74	154	164	166	158	179	153										
76	156	167	168	163	181	158	194	153								
78	160	170	171	167	183	163	196	158	208	153						
80			175	170	186	167	198	162	210	158	223	153				
82					190	170	201	166	213	162	225	157	238	153		
84							204	170	216	166	227	162	240	157	253	153
86							208	174	219	170	231	166	242	161	255	157
88									223	174	234	170	246	165	257	160
90											238	174	249	170	260	165
92													252	174	264	169
94															267	174
96																

TXV Refrigerant Charging Chart with ZRK4 Compressors

1.5 Ton HP ZRK4 TXV Charging Chart

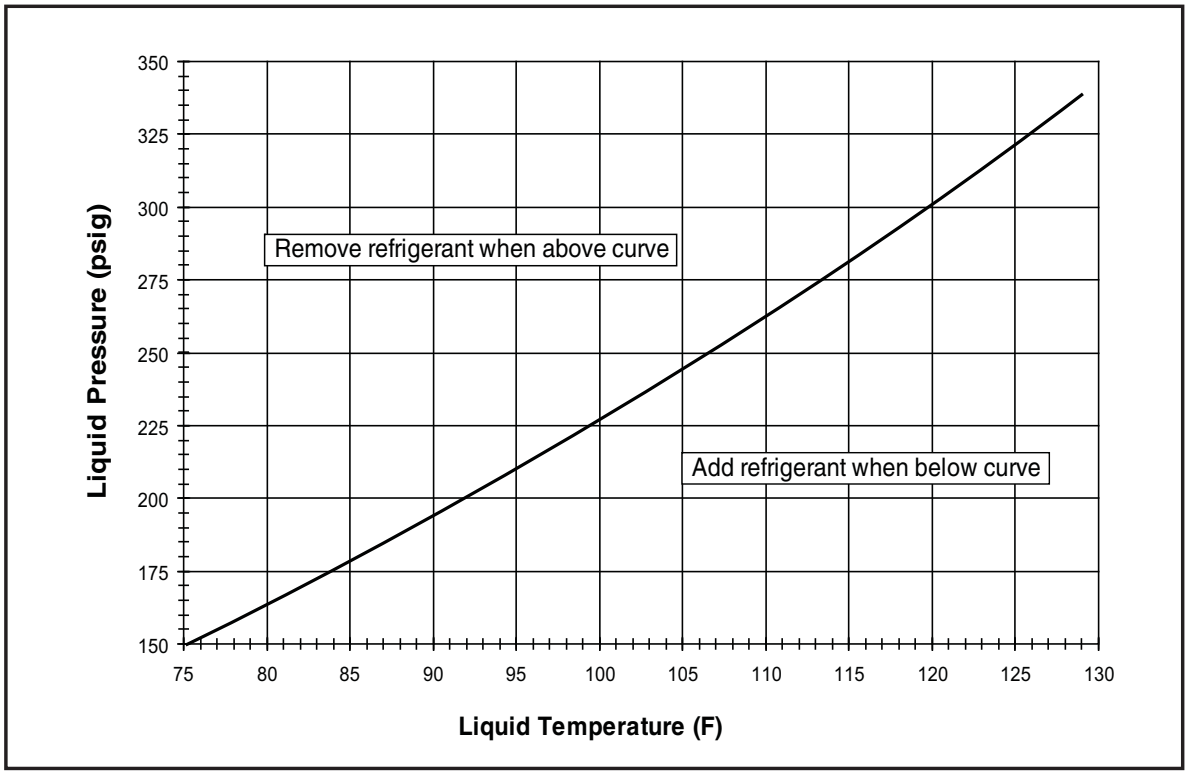


2.0 Ton HP ZRK4 TXV Charging Chart

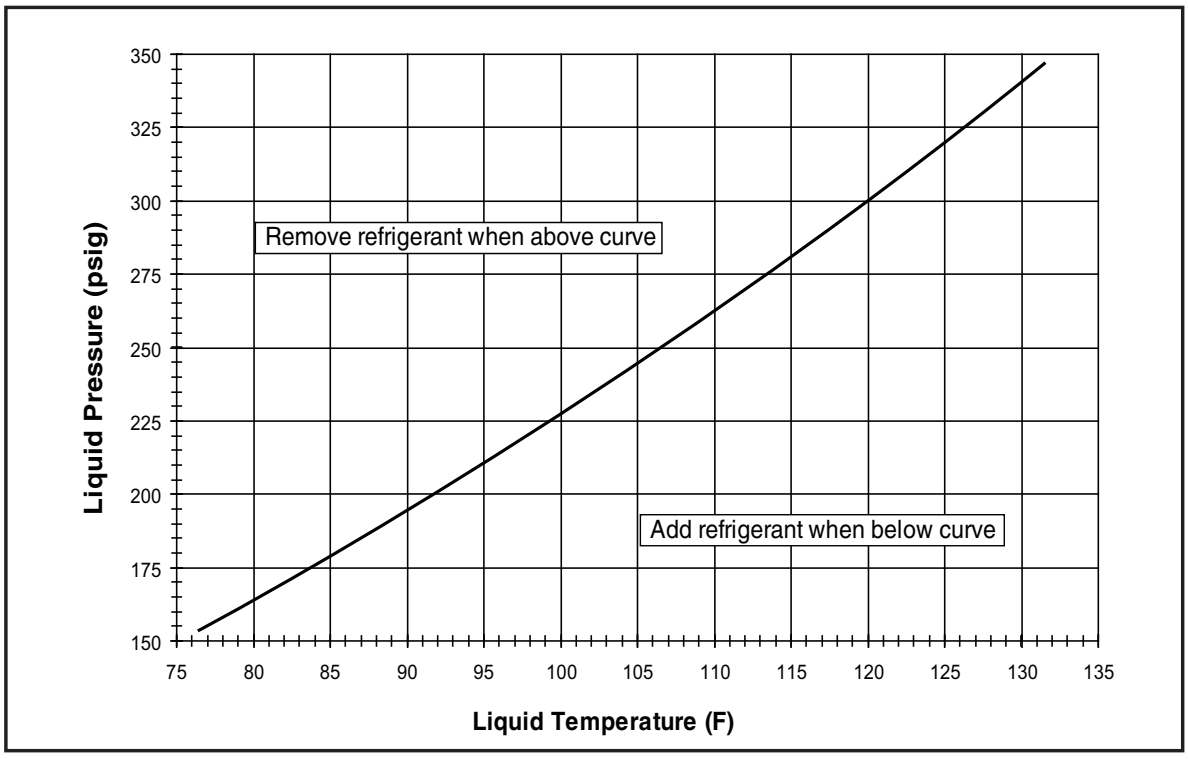


TXV Refrigerant Charging Chart with ZRK3 Compressors Continued

2.5 Ton HP ZRK3 TXV Charging Chart

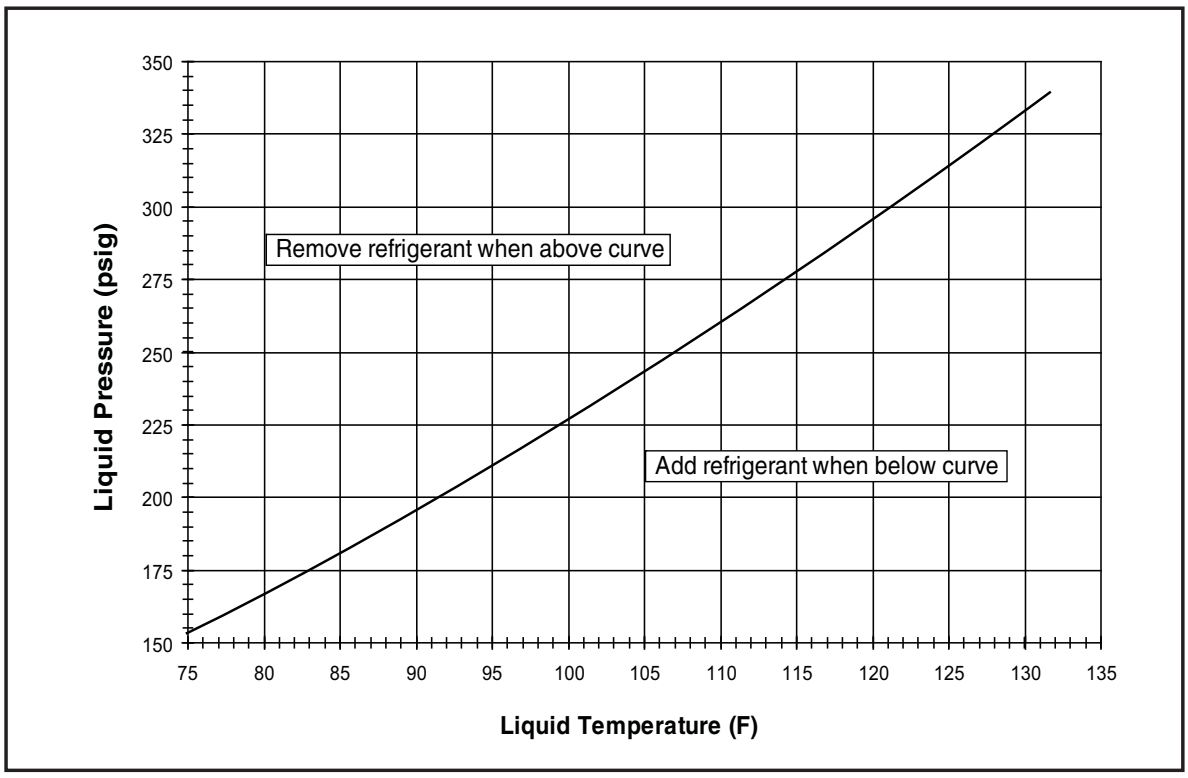


3.0 Ton HP ZRK3 TXV Charging Chart

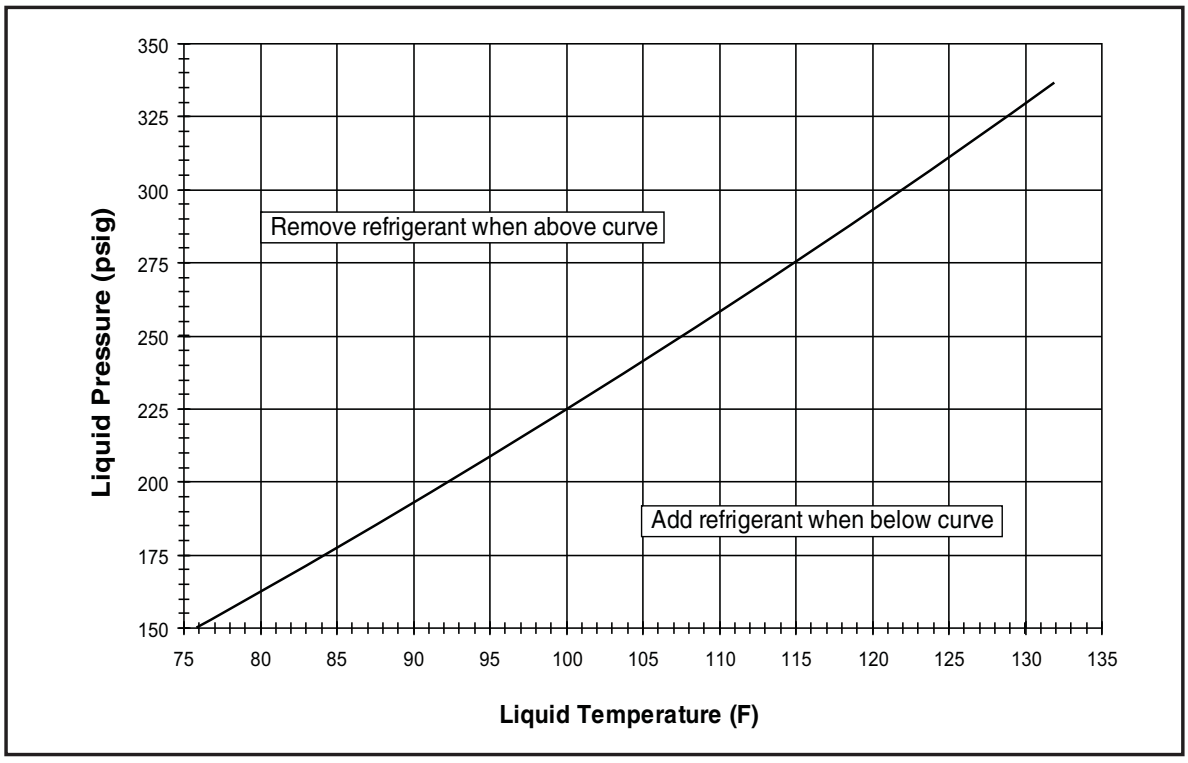


TXV Refrigerant Charging Chart with ZRK3 Compressors Continued

3.5 Ton HP ZRK3 TXV Charging Chart

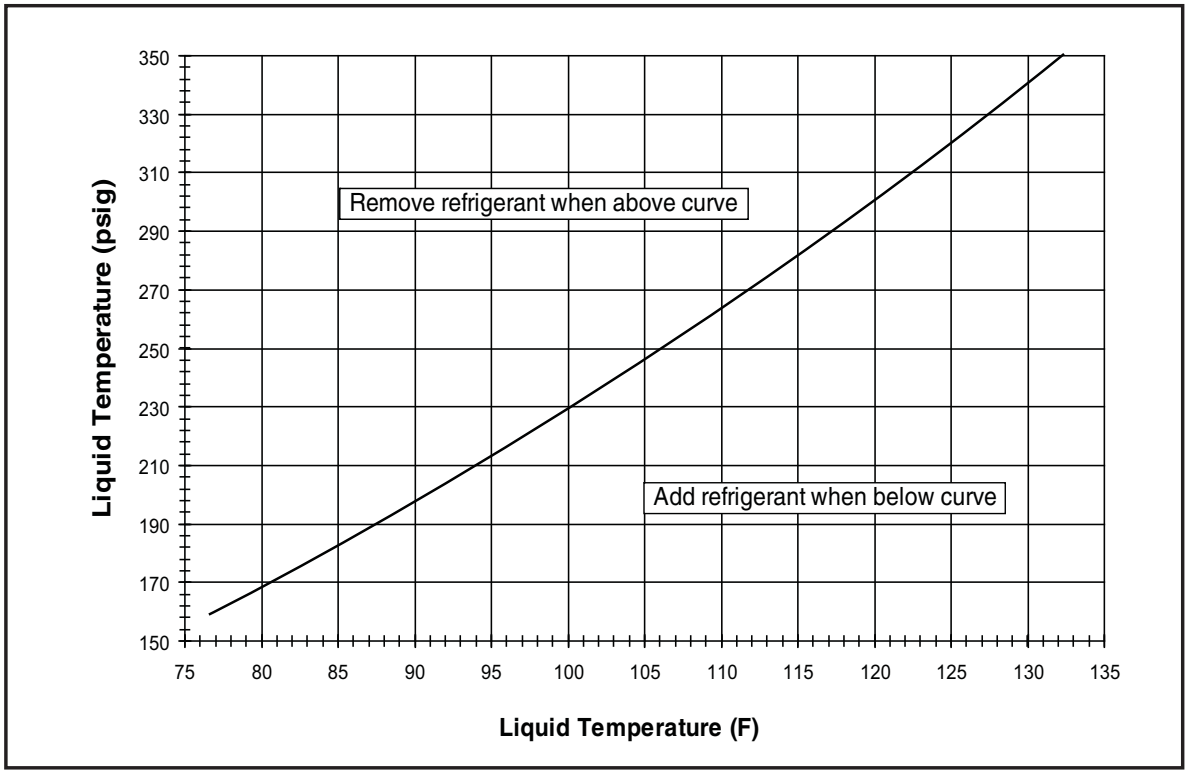


4.0 Ton HP ZRK3 TXV Charging Chart



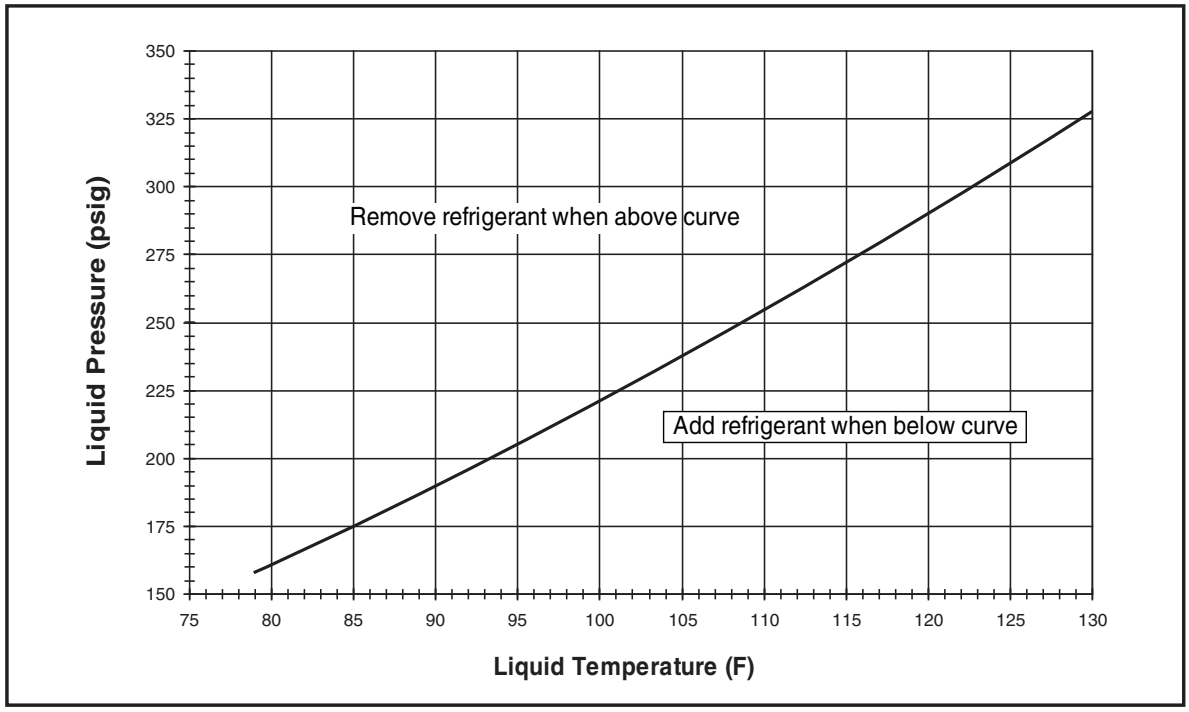
TXV Refrigerant Charging Chart with ZRK3 Compressors (Continued)

5.0 Ton HP ZRK3 TXV Charging Chart

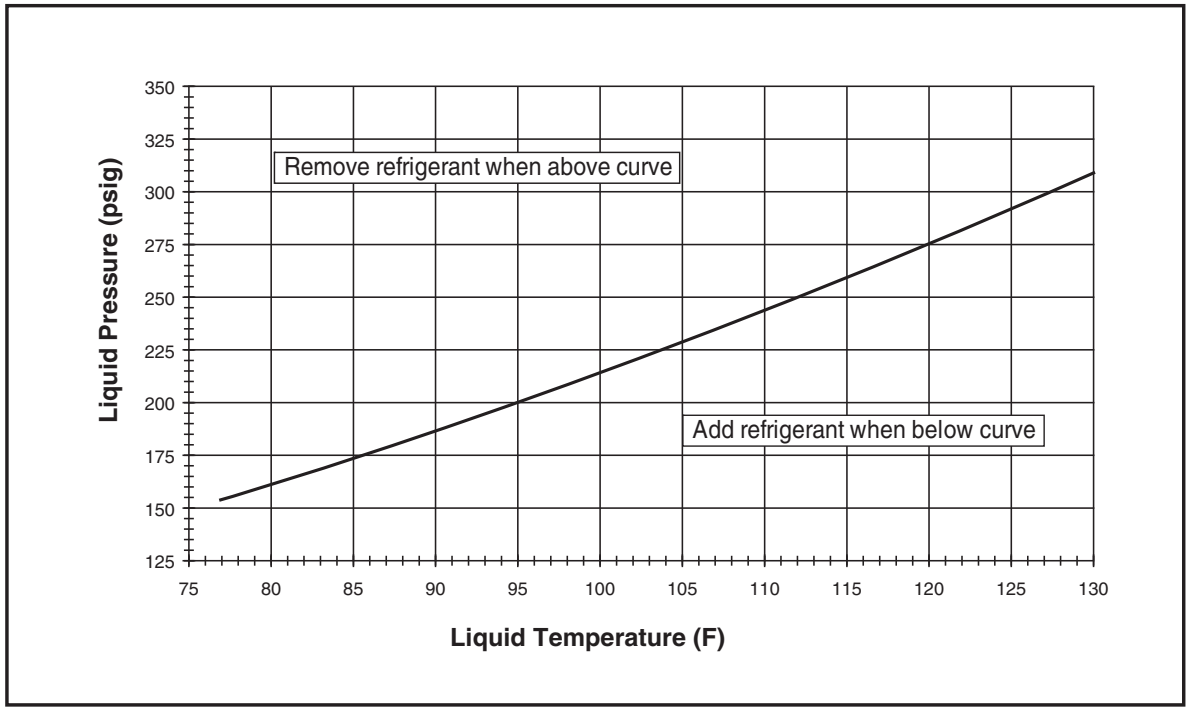


TXV Refrigerant Charging Chart with CRK7 Compressors

2.0 Ton HP CRK7 TXV Charging Chart



2.5 Ton HP CRK7 TXV Charging Chart



Refrigerant Charging Charts for Heating Mode of Operation
13 SEER Split System Heating Charts with ZRK4 Compressors

1.5 Ton	OUTDOOR TEMPERATURE (DEG. F)																			
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
13	111	113	23	132	120	32	152	127	41	173	134	51	181	149	61	201	172	70	221	195
14	118	111	24	138	118	33	157	125	42	176	132	52	188	146	62	208	167	71	228	188
15	125	109	25	144	116	34	162	123	43	180	130	53	195	143	63	215	163	72	235	182
16	132	107	26	149	114	35	167	121	44	184	128	54	202	140	64	222	158	73	242	176
17	139	105	27	155	112	36	171	119	45	187	126	55	209	138	65	229	154	74	249	170
18	146	103	28	161	110	37	176	117	46	191	124	56	216	135	66	236	149	75	256	164
19	153	101	29	167	108	38	181	115	47	195	122	57	223	132	67	243	145	76	263	158

2.0 Ton	OUTDOOR TEMPERATURE (DEG. F)																			
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
12	120	107	21	135	119	29	150	131	37	165	142	46	169	158	56	184	177	66	200	196
13	127	105	22	141	117	30	155	129	38	169	140	47	176	155	57	191	172	67	207	189
14	134	103	23	147	115	31	160	127	39	173	138	48	183	152	58	198	168	68	214	183
15	141	101	24	153	113	32	165	125	40	176	136	49	190	149	59	205	163	69	221	177
16	148	99	25	159	111	33	169	123	41	180	134	50	197	146	60	212	159	70	228	171
17	155	97	26	165	109	34	174	121	42	184	132	51	204	144	61	219	154	71	235	165
18	162	95	27	171	107	35	179	119	43	187	130	52	211	141	62	226	150	72	242	159

Refrigerant Charging Charts for Heating Mode of Operation
13 SEER Split System Heating Charts with ZRK3 Compressors

2.5 Ton	OUTDOOR TEMPERATURE (DEG. F)																			
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
13	115	110	22	137	119	30	159	129	39	181	138	48	191	153	56	211	174	65	230	196
14	122	108	23	143	117	31	164	127	40	185	136	49	198	150	57	218	170	66	237	190
15	129	106	24	149	115	32	169	125	41	189	134	50	205	147	58	225	165	67	244	183
16	136	104	25	155	113	33	174	123	42	192	132	51	212	145	59	232	161	68	251	177
17	143	102	26	161	111	34	179	121	43	196	130	52	219	142	60	239	157	69	258	171
18	150	100	27	167	109	35	183	119	44	200	128	53	226	139	61	246	152	70	265	165
19	157	98	28	173	107	36	188	117	45	203	126	54	233	136	62	253	148	71	272	159

3.0 Ton	OUTDOOR TEMPERATURE (DEG. F)																			
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
13	116	120	22	136	125	31	156	130	40	176	136	49	183	151	59	201	175	68	218	199
14	123	118	23	142	123	32	161	128	41	180	134	50	190	148	60	208	170	69	225	193
15	130	116	24	148	121	33	166	126	42	183	132	51	197	145	61	215	166	70	232	187
16	137	114	25	154	119	34	171	124	43	187	130	52	204	142	62	222	161	71	239	181
17	144	112	26	160	117	35	175	122	44	191	128	53	211	139	63	229	157	72	246	174
18	151	110	27	166	115	36	180	120	45	194	126	54	218	136	64	236	152	73	253	168
19	158	108	28	172	113	37	185	118	46	198	124	55	225	134	65	243	148	74	260	162

Refrigerant Charging Charts for Heating Mode of Operation
13 SEER Split System Heating Charts with ZRK3 Compressors

3.5 Ton	OUTDOOR TEMPERATURE (DEG. F)																	
	10			20			30			40			50			60		
Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
118	27	140	124	31	151	130	35	162	136	44	173	149	58	206	168	72	239	187
116	28	146	122	32	156	128	36	166	134	45	180	146	59	213	163	73	246	181
114	29	152	120	33	161	126	37	169	132	46	187	143	60	220	159	74	253	175
112	30	158	118	34	165	124	38	173	130	47	194	140	61	227	154	75	260	168
110	31	163	116	35	170	122	39	177	128	48	201	137	62	234	150	76	267	162
108	32	169	114	36	175	120	40	180	126	49	208	134	63	241	145	77	274	156
106	33	175	112	37	180	118	41	184	124	50	215	132	64	248	141	78	281	150

4.0 Ton	**OUTDOOR TEMPERATURE (DEG. F)**																	
0			**10**			**20**			**30**			**40**			**50**			**60**	
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
13	114	115	21	132	121	30	150	127	38	168	133	47	175	150	57	194	178	66	213	205
14	121	113	22	138	119	31	155	125	39	172	131	48	182	147	58	201	173	67	220	199
15	128	111	23	144	117	32	160	123	40	175	129	49	189	144	59	208	169	68	227	193
16	135	109	24	150	115	33	165	121	41	179	127	50	196	142	60	215	164	69	234	187
17	142	107	25	156	113	34	169	119	42	183	125	51	203	139	61	222	160	70	241	180
18	149	105	26	162	111	35	174	117	43	186	123	52	210	136	62	229	155	71	248	174
19	156	103	27	168	109	36	179	115	44	190	121	53	217	133	63	236	151	72	255	168

Refrigerant Charging Charts for Heating Mode of Operation
13 SEER Split System Heating Charts with ZRK3 Compressors

5.0 Ton	OUTDOOR TEMPERATURE (DEG. F)																			
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
12	114	141	20	141	145	28	168	149	36	195	153	45	209	166	55	236	189	65	262	212
13	121	139	21	147	143	29	173	147	37	198	151	46	216	163	56	243	184	66	269	206
14	128	137	22	153	141	30	177	145	38	202	149	47	223	160	57	250	180	67	276	200
15	135	135	23	159	139	31	182	143	39	206	147	48	230	158	58	257	175	68	283	193
16	142	133	24	165	137	32	187	141	40	209	145	49	237	155	59	264	171	69	290	187
17	149	131	25	171	135	33	192	139	41	213	143	50	244	152	60	271	166	70	297	181
18	156	129	26	176	133	34	196	137	42	217	141	51	251	149	61	278	162	71	304	175

Refrigerant Charging Charts for Heating Mode of Operation
13 SEER Split System Heating Charts with CRK7 Compressors

2.0 Ton	OUTDOOR TEMPERATURE (DEG. F)																		
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
16	109	104	25	126	110	34	143	117	43	159	123	51	164	140	60	179	169	68	195	197
17	116	102	26	132	108	35	148	115	44	163	121	52	171	138	61	186	164	69	202	191
18	123	100	27	138	106	36	152	113	45	167	119	53	178	135	62	193	160	70	209	185
19	130	98	28	144	104	37	157	111	46	170	117	54	185	132	63	200	155	71	216	179
20	137	96	29	150	102	38	162	109	47	174	115	55	192	129	64	207	151	72	223	173
21	144	94	30	156	100	39	167	107	48	178	113	56	199	126	65	214	146	73	230	167
22	151	92	31	161	98	40	171	105	49	181	111	57	206	123	66	221	142	74	237	160

2.5 Ton	OUTDOOR TEMPERATURE (DEG. F)																		
0			10			20			30			40			50			60		
Suc. Press	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.	Suc. Press.	Liquid Press.	Disch. Temp.
18	107	82	25	128	102	32	148	121	39	168	141	48	177	160	57	197	177	66	218	195
19	114	80	26	133	100	33	153	119	40	172	139	49	184	157	58	204	173	67	225	189
20	121	78	27	139	98	34	157	117	41	175	137	50	191	154	59	211	168	68	232	183
21	128	76	28	145	96	35	162	115	42	179	135	51	198	151	60	218	164	69	239	177
22	135	74	29	151	94	36	167	113	43	183	133	52	205	148	61	225	159	70	246	170
23	142	72	30	157	92	37	172	111	44	186	131	53	212	146	62	232	155	71	253	164
24	149	70	31	163	90	38	177	109	45	190	129	54	219	143	63	239	150	72	260	158

INSTALLER: PLEASE LEAVE THESE INSTALLATION INSTRUCTIONS WITH THE HOMEOWNER.

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